AMENDMENTS TO THE SPECIFICATION

In paragraph [0025]:

Fig.4 shows a schematic diagram of an HBT power amplifier ~~10"~~ 10' according to a second embodiment of the present invention. The HBT power amplifier ~~10"~~ 10' is similar to the HBT power amplifier 10 except that the HBT ~~10"~~ 10' comprises a second enlarged emitter 14b rather than the emitter 14a. The HBT power amplifier ~~10"~~ 10' further differs in that emitter electrodes ~~20"~~ 20' are backside vias provided to both enlarged emitters 14b. As a result, heat dissipation from the emitters 14b is evenly distributed between the emitters 14b as represented by an arrow 44. Similar to the preferred embodiment, the backside vias ~~20"~~ 20' conduct the heat 44 to a heat sink (item 30, Fig.5). The electrical operation of the HBT ~~10"~~ 10' is substantially the same as that of HBT 10. Furthermore, electrical grounding of the emitters 14b provided by the backside vias ~~20"~~ 20' is essentially identical to the electrical grounding provided by the flip-chip bumps 20 in the preferred embodiment. A further difference of the second embodiment as shown in Fig.4 is that the metallization layer 18 is optional as emitters 14b are both thermally connected and electrically grounded to the heat sink 30. With this structure, the present invention provides enhanced cooling to functional devices of the HBT such as the emitters 14b.

In paragraph [0026]:

Please refer to Fig.5. Fig.5 is a cross-sectional view of the HBT power amplifier ~~10"~~ 10' of Fig.4 along a section line 5-5 shown in Fig.4. The heat sink 30 is a backside metal layer. As shown in Fig.5, backside vias ~~20"~~ 20' penetrate the substrate 50. Heat is conducted from the emitters 14b through the backside vias ~~20"~~ 20' and to the metal layer 30 as represented by arrows 46. The enhanced thermal conduction as provided by the second embodiment of the present invention allows the HBT power amplifier ~~10"~~ 10' to operate at a substantially high power.

In paragraph [0027]:

Naturally, the present invention as described in the preferred embodiment and the second embodiment, can be applied to an HBT power amplifier having arrays of bases, emitters, collectors, and other functional devices. Fabrication of the present invention HBT power amplifiers 10, ~~10''~~ 10' can be accomplished by currently available semiconductor manufacturing technologies.

In paragraph [0028]:

Generally, the emitter areas are enlarged, as illustrated by emitters 14b, so that the flip-chip bump 20 or the backside via ~~20''~~ 20' can be placed depending on the specific application of the HBT amplifier 10, ~~10~~ 10'. An increased amount of flip-chip bumps 20 or backside vias ~~20''~~ 20' tends to increase thermal efficiency at the expense of device area. Thus, a specific layout to maximize thermal efficiency while minimizing device area is a design choice.